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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/795,904	03/08/2004	Richard L. McCreery	OSU1159-198A	1545
8698	7590	12/30/2005	EXAMINER	
STANDLEY LAW GROUP LLP 495 METRO PLACE SOUTH SUITE 210 DUBLIN, OH 43017			ZACHARIA, RAMSEY E	
			ART UNIT	PAPER NUMBER
			1773	

DATE MAILED: 12/30/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/795,904

Applicant(s)

MCCREERY, RICHARD L.

Examiner

Ramsey Zacharia

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-33 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-33 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 08 March 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 03/08/2004.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_.

## **DETAILED ACTION**

### ***Specification***

1. The Applicant is requested to update the cross reference information in the first paragraph of the specification.

### ***Claim Rejections - 35 USC § 112***

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 1-33 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

4. The term "strong" in independent claims 1 and 18 is a relative term which renders the claims indefinite. The term "strong" is not defined by the claims, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention. Use of the term "strong" renders the bond strength of the electronic coupling indefinite.

### ***Claim Rejections - 35 USC § 102***

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

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(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

6. Claims 1-6 and 9-17 are rejected under 35 U.S.C. 102(b) as being anticipated by Zhou et al. (Appl. Phys. Lett. 71 (5), 1997).

Zhou et al. teach a molecular wire comprising monolayer of parallel, biphenyl units covalently bonded to the surface of a gold electrode (Figure 1). A layer of titanium and gold is formed over the monolayer to form a top electrode. Because the top electrode is exposed, at least some of the outer surface will inherently oxidize resulting in a top electrode that comprises both a metal and a metal oxide wherein the metal oxide is gold oxide and/or titanium oxide.

7. Claims 1-7, 9-26, and 29-33 are rejected under 35 U.S.C. 102(e) as being anticipated by Gryko et al. (U.S. Patent 6,324,091).

Gryko et al. teach an apparatus for storing data comprising a storage medium having first and second subunits coupled to a working electrode (corresponding to substrate of first conductive component) and a reference electrode (corresponding to the second conductive component) (Figure 1 and column 3, lines 53-60). Suitable subunits include various compounds having substituted and unsubstituted phenyl groups, such as porphyrinic macrocycles, metallocene, etc. (column 3, line 60-column 4, line 6). The storage molecule is electrically coupled to the electrode by either a direct covalent link (i.e. R---X chemical bond) or direct or indirect ionic bonding (which is taken to read on "strong electronic coupling") (column 7, lines

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46-65). The molecules self-assemble on the electrode substrate (e.g. a metal such as gold) to form an organized monolayer that may be arranged in an upright orientation (column 23, lines 40-57). This orientation indicates that the molecules of the self assembled layer will be substantially parallel to each other. The electrodes may be formed of a metal such as gold, silver, or copper (column 52-58). Because the electrodes are exposed, at least some of the outer surface will inherently oxidize resulting in electrodes that comprises both a metal and a metal oxide wherein the metal oxide is gold, silver, or copper oxide.

An alternative embodiment comprises a mirror image construct as shown in Figure 4. In this embodiment, one working electrode and storage medium reads on the first conductive component and the other working electrode and storage medium reads on the second conductive component.

### ***Claim Rejections - 35 USC § 103***

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claims 7 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zhou et al. (Appl. Phys. Lett. **71** (5), 1997).

Zhou et al. teach all the limitations of claim 7, as outlined above, except for chemically bonding a carbon or oxygen atom of the molecular unit to a metal, silicon, or carbon unit of the

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substrate. Zhou et al. teach a chemical linkage of metal-S formed by the use of thiol functionalized biphenyl.

However, it would be obvious to one skilled in the art to use the analogous alcohol functionalized biphenyl (which would result in a metal-O chemical bond) since thiols and alcohols have similar structures and are known to behave in an analogous manner. See MPEP 2144.09.

Zhou et al. teach all the limitations of claim 8, as outlined above, except for the use of electrically conductive carbon as the bottom electrode. Zhou et al. teach gold as the electrode material.

However, it would be within the ability of one skilled in the art to select any known electrically conductive material, including electrically conductive carbon, for the bottom electrode since the function of the bottom electrode is to conduct electricity. The selection of a material based on its suitability for its intended use supports a *prima facie* obviousness determination. See MPEP 2144.07.

10. Claims 8, 27, and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gryko et al. (U.S. Patent 6,324,091).

Gryko et al. teach all the limitations of claims 8, 27, and 28, as outlined above, except for the use of electrically conductive carbon as the working electrodes. Gold is the preferred electrode material, however Gryko et al. recognizes that numerous other materials are suitable for use as the electrode including other metals, metal alloys, organic conductors, nanostructures, crystals, etc. (column 26, lines 52-58).

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Therefore, it would be within the ability of one skilled in the art to select any known electrically conductive material, including electrically conductive carbon, for the working electrode since the function of the working electrode is to conduct electricity. The selection of a material based on its suitability for its intended use supports a *prima facie* obviousness determination particularly in view of Gryko et al. recognition that the electrodes may be constructed from other suitable materials. See MPEP 2144.07.

### ***Double Patenting***

11. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

12. Claims 1, 8, 10-12, and 18 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-7 and 16-18 of copending Application No. 10/754,410. Although the conflicting claims are not identical, they are not patentably distinct from each other because the inventions of instant claims 1, 8, 10-12, and 18 represent a genus of which the inventions described by claims 1-7 and 16-18 of

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compending Application No. 10/754,410 are species. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993). The conjugated bond required in 1-7 and 16-18 of compending Application No. 10/754,410 is a species of covalent bonding required by instant claims 1, 8, 10-12, and 18.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

13. Claims 1-33 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 32-39, 52, 53, 62, 63, 65-67, 79, 84, 85, 87, 88, 100, 104, 105, 107-109, and 120 of U.S. Patent No. 6,855,950. Although the conflicting claims are not identical, they are not patentably distinct from each other because the inventions of instant claims 1-33 represent a genus of which the inventions described by claims 32-39, 52, 53, 62, 63, 65-67, 79, 84, 85, 87, 88, 100, 104, 105, 107-109, and 120 of U.S. Patent No. 6,855,950 are species. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993). The conjugated bond required in claims 32-39, 52, 53, 62, 63, 65-67, 79, 84, 85, 87, 88, 100, 104, 105, 107-109, and 120 of U.S. Patent No. 6,855,950 is a species of covalent bonding required by instant claims 1-33.

### ***Conclusion***

14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ramsey Zacharia whose telephone number is (571) 272-1518.


The examiner can normally be reached on Monday through Friday from 9 to 5.



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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Carol Chaney, can be reached at (571) 272-1284. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



**Ramsey Zacharia**  
Primary Examiner  
Tech Center 1700